

REMARKS

The Examiner rejected Claims 1-3, 5-11, 13-14 and 16-22 under 35 U.S.C. 102(b) as being anticipated by Vanier (US 6,320,472). Applicant traverses this rejection. The Examiner has the burden of showing by reference to the cited art each claim limitation in the reference. Anticipation under 35 U.S.C. 102 requires that each element of the claim in issue be found either expressly or inherently in a single prior art reference. *In re King*, 231 USPQ 136, 138 (Fed. Cir. 1986); *Kalman v. Kimberly-Clark Corp.*, 218 USPQ 781, 789 (Fed. Cir. 1983). The mere fact that a certain thing may result from a given set of circumstances is not sufficient to sustain a rejection for anticipation. *Ex parte Skinner*, 2 USPQ2d 1788, 1789 (BdPatApp&Int 1986). "When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference" (*In re Rijckaert*, 28 USPQ2d, 1955, 1957). Under the doctrine of inherency, if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to anticipate a subsequent claim if the missing element "is necessarily present in the thing described in the reference..." *Cont'l Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). "Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art." *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295, 63 USPQ2d 1597, 1599 (Fed. Cir. 2002) (quoting *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

The Examiner maintains that the "Lock-In Detector" of loops 1 and 2 generates a signal exhibiting an asymmetry as a function of frequency u in a frequency range about a frequency u_0 . The Examiner points to Fig. 8A, where there is, according to the Examiner, an asymmetry about diode current i_0 , in which the diode detects signal i_0 proportional to the light emitted by the laser as supporting this assertion. Applicant respectfully disagrees with the Examiner's reading of Vanier. First, if anything, the function shown in Figure 8A is symmetric around the current i_0 . Second, the function shown in Figure 8A is the light output as a function of the current in the laser. Since the relationship between the laser current and the laser output frequency is not given, one cannot determine if there is an asymmetry about the frequency at a particular frequency. Third, there is no mention of asymmetries in Vanier.

The Examiner goes on to assert that loops 1 and 2 alter one of u_L , said first CPT component amplitude, and said second CPT component amplitude in a manner that reduces the asymmetry. As noted above, there is no mention of asymmetries in Vanier. The loops in question servo the laser frequency and the microwave frequency in an attempt to maintain the microwave frequency at a predetermined value. However, there is no teaching of reducing any asymmetry in the output of the detector. Accordingly, Applicant submits that the Examiner has failed to show all of the limitations of Claim 1, Claim 13, or the claims dependent therefrom, and hence, a rejection for anticipation cannot be sustained.

With respect to Claim 6, the Examiner identifies the 107 Hz modulator in loop 1 as the modulator recited in Claim 5 and the output from the signal adder in loop 1 as the second control signal. The Examiner maintains that this modulator also modulates the phase, or the frequency and amplitude, of the laser output in a manner determined by a third control signal which the Examiner identifies as the output of the signal adder in loop 2. It should be noted that the signal adder in loop 2 is not connected to the modulator in loop 1, and hence, the modulator identified by the Examiner could not perform this function. Furthermore, there is no servo loop that reduces asymmetry. Accordingly, there are additional grounds for allowing Claim 6.

The Examiner rejected Claims 4 and 15 under 35 U.S.C. 103(a) as being unpatentable over Vanier in view of Zhu, *et al* (hereafter "Zhu"). Applicant traverses this rejection and repeats the arguments made above with respect to the missing teachings in Vanier. Zhu does not provide the missing teachings.

In making this rejection, the Examiner admits that Vanier does not teach the limitation that "said electromagnetic radiation source further generates additional frequency components for altering an AC Stark shift in said quantum absorber, said additional frequency components having amplitudes and/or frequencies that are determined by a Stark shift control signal, and wherein said apparatus further comprises an AC Stark shift servo loop for generating said Stark shift control signal." The Examiner looks to Zhu for the missing teaching. The Examiner does not point to any teaching in the references as to how the system of Zhu would be integrated into that of Vanier to provide the desired functionality. Absent some guidance in this regard, there is no reasonable expectation of success in combining the

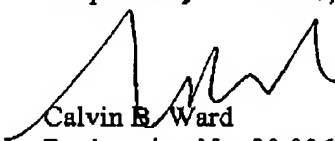
teachings of the two references. Since the Examiner has failed to show the limitations missing from Vanier and any suggestion as to how one would combine the two systems, Applicant submits that the Examiner has not made a *prima facie* case for obviousness with respect to Claims 4, and 15.

The Examiner rejected Claims 12 and 23 under 35 U.S.C. 103(a) as being unpatentable over Vanier. Applicant traverses this rejection and repeats the arguments made above with respect to the missing teachings in Vanier.

In making this rejection, the Examiner admits that Vanier does not disclose the recited list of ions. The Examiner maintains that these ions are obvious because the Applicant has not provided a reason why they are preferable over Cesium or Rubidium. Applicant does not have the burden of proving that these ions have preferred qualities. The Examiner, not the Applicant, has the burden of proof here. In addition, the Examiner notes that Applicant states that any material used in a quantum absorber that exhibits the CPT effect can be used. This argument amounts to hindsight reconstruction, which is not a permissible method for constructing a rejection under 35 U.S.C. 103. The information in question must be present in the art, not just in the Applicant's application. Accordingly, Applicant submits that the Examiner has not made a *prima facie* case for obviousness with respect to Claims 12 and 23.

I hereby certify that this paper is being sent by FAX to 571-273-8300.

Respectfully Submitted,



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